



## EWDA network for wildlife health surveillance in Europe

### Summary of data presented at the Inaugural meeting Brussels, 15 October 2009

**EWDA wildlife health network committee: Marie-Pierre Ryser-Degiorgis<sup>1</sup>, Dolores Gavier-Widen<sup>2</sup>, Christian Gortazar-Schmidt<sup>3</sup>, Thijs Kuiken<sup>4</sup> (t.kuiken@erasmusmc.nl)**

1. Centre for Fish and Wildlife Health, University of Bern, Bern, Switzerland; 2. National Veterinary Institute, Uppsala, Sweden; 3. National Wildlife Research Institute IREC (CSIC-UCLM-JCCM), Ciudad Real, Spain; 4. Erasmus Medical Centre, Rotterdam, The Netherlands.

#### Introduction

The surveillance of diseases in wild animals is a relatively new activity compared to the surveillance of diseases in humans or domestic animals. In recent years, new centres and programmes have been developed to perform wildlife health surveillance, and international organizations such as the O.I.E. have stressed the importance of this activity.

There are several reasons for this growing interest. A major factor has been the increased awareness of the role of wild animals in infectious diseases of humans. Another is the involvement of wild animals in diseases of domestic animals. Disease also may play an important role in the conservation and management of wild animal populations.

At the moment, there is no Europe-wide network of wildlife health surveillance. This means that wildlife disease events occurring in one country in Europe are not necessarily known to another country, and that other information and knowledge about wildlife health are not necessarily shared. Yet it is important to have a European network, because neither wild animals nor their diseases respect national borders.

In order to collect information on wildlife health surveillance systems in Europe, a questionnaire survey was carried out by the EWDA in autumn 2009. Europe counts 49 countries, of which 27 are members of the European Union (EU), three are candidates, and 19 have another status (Tables 1, 2). Twenty-five countries (Table 2) participated in the survey. The answers compiled below are based on self-evaluation of the participating countries.

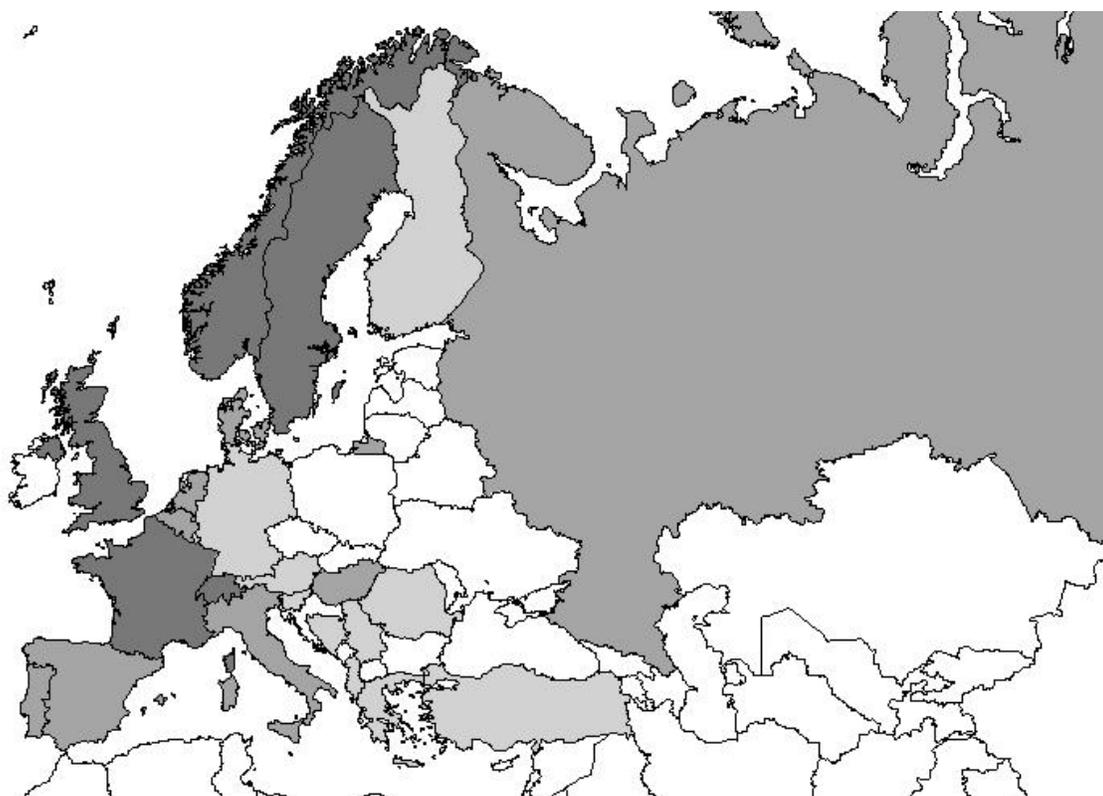
#### Compilation of data

##### 1. Health surveillance systems

Eight countries indicated that they have comprehensive general wildlife health surveillance (i.e. one or several programmes covering the entire country and being comprehensive with respect to species of mammals and birds examined and types of diseases assessed; Table 2, Figure 1). Six countries considered that they have partial general wildlife health surveillance (wide range of programmes including detection, diagnosis and management of disease-related information, but restricted in various ways). Restrictions mentioned included geographical limitation, programme duration, selection of species (e.g., game) or diseases, and lack of coordination between different programmes within the same country.

Eleven countries answered that they have no general wildlife health surveillance (no programme of general wildlife health surveillance), but do perform surveillance for a few selected diseases. Diseases mentioned were rabies (9 out of 12 countries that answered this question), avian influenza (6), tuberculosis (4), classical swine fever (4), trichinellosis (4), paratuberculosis (3), transmissible spongiform encephalopathy (3), echinococcosis (2), ecto- and endoparasites without further specification (2), Aujeszky's disease, bluetongue, porcine circovirus infection, encephalomyocarditis in wild boar and rodents, European brown hare syndrome, tularemia, and Crimean-Congo hemorrhagic fever (one country each).

Figure 1. Map of Europe depicting the surveillance programmes for wildlife health according to a self-evaluation of the participating countries (N=25). White: no data; Dark grey: comprehensive general wildlife health surveillance; Middle grey: Partial general wildlife health surveillance (wide range of programmes but restriction in various ways); Light grey: No general wildlife health surveillance, but some degree of surveillance for a few specified diseases.



## 2. Funding of wildlife health investigations

Except for two countries (Albania, Serbia), all participating countries receive a financial support from the government (Table 2). In addition, surveillance is also supported by hunters in six countries, by a university in three countries, by research projects in three countries, by non-governmental organizations, farm industry and environmental organizations in one country each.

### 3. Number of wildlife health surveillance programmes per country

Six countries have only one wildlife health surveillance programme (Andorra, Bosnia&Herzegovina, Denmark, Italy, Luxembourg, Slovenia; Table 2), nine countries have 2-4 programmes (Austria, Finland, Germany, Hungary, Norway, Russia, Serbia, Sweden, Switzerland), four countries have 5-9 programmes ( France, Greece, The Netherlands, Spain), four countries have 10 or more programmes (Belgium, Portugal, Romania, United Kingdom), and two countries have no programme at all (Albania, Turkey).

### 4. Number of people working on wildlife health surveillance

In general, numbers of people involved in wildlife surveillance are low (Table 2). Full-time employees vary from 1-20 but are mostly below 10. Part-time personnel show an even wider margin (2-100), but remains below 10 in nearly half of the countries.

### 5. Number of cases examined per year per country

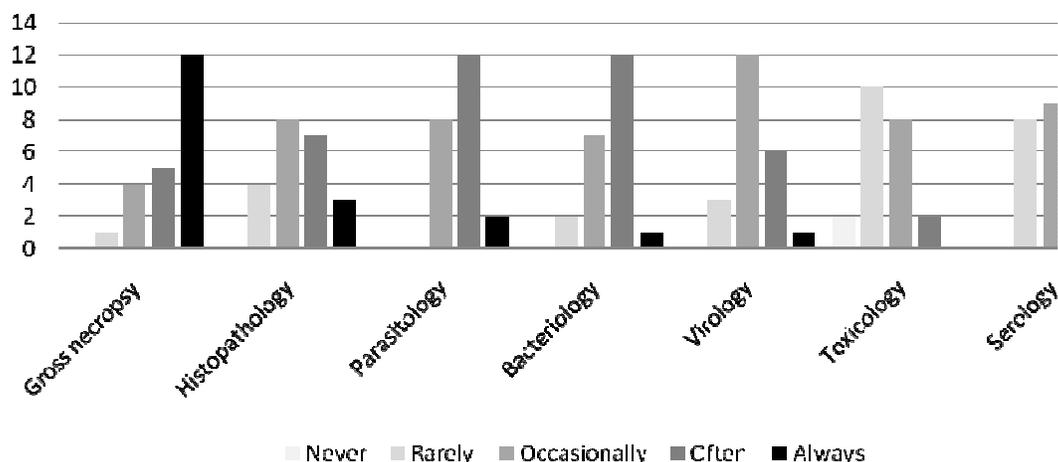
Data on the approximate number of animals examined per year were available from 19 countries (Table 3), with a range of 30 to 5 000 cases of animals found dead or shot due to a disease condition per year. Compared with the size of the countries, this is far less than one case per km<sup>2</sup> per year in all countries concerned. Overall, about 18 700 wild animals are examined each year.

Regarding apparently healthy animals tested for selected disease agents in the frame of specific surveillance programmes, the estimated number of examinations reaches 52 700. All together (healthy and diseased cases), 70 000 animals or more are submitted to laboratory examination in Europe each year.

### 6. Techniques of examination

Sixty percent of the countries report to often (5/22) or even always (12) perform a necropsy on submitted carcasses, and 45% (10) often/always carry out a histological examination of tissue samples (Figure 2). Around 60% of the reporting countries often/always perform parasitological (14) and bacteriological (13) examinations. Virology is mostly only occasionally (12) conducted, but 6 countries often use it. In contrast, toxicological examinations are rare (10) or occasional (8), as well as serology (8 and 9, respectively).

Figure 2. Frequency of use of investigation techniques in the frame of wildlife health surveillance programmes in 22 European countries, expressed in number of countries and frequency categories.



## 7. Presence of records on wildlife disease surveillance

Eight countries possess records for more than 30 years (Austria, Bosnia&Herzegovina, Denmark, Finland, France, Norway, Slovenia, Sweden, Switzerland; Table 2), and six countries have records for >10 to 30 years (Germany, Greece, Hungary, Italy, Luxembourg, United Kingdom). Three countries have records for a period of 5-10 years (Albania, Andorra, Romania), and three countries have records for less than 5 years (The Netherlands, Serbia, Spain).

Table 1. European countries for which no information is available to date (N=24) regarding wildlife health surveillance (no reply to the questionnaire survey).

Country	EU status <sup>1</sup>	Area (km <sup>2</sup> )	Inhabitants (millions)
Armenia	o	29 743	3.0
Azerbaijan	o	86 600	8.1
Belarus	o	207 600	9.7
Bulgaria	m	111 910	7.6
Croatia	c	56 542	4.4
Cyprus	m	9 250	0.8
Czech Republic	m	78 866	10.3
Estonia	m	45 000	1.4
Georgia	o	69 700	4.6
Iceland	o	103 000	0.3
Ireland	m	70 000	4.0
Latvia	m	65 000	2.3
Liechtenstein	o	160	0.03
Lithuania	m	65 000	3.4
(Former Yugoslav Republic of) Macedonia	c	25 333	2.05
Malta	m	326	0.4
Moldova	o	33 843	4.3
Monaco	o	1.95	0.03
Montenegro	o	14 026	0.7
Poland	m	312 679	38.1
San MariNone	o	61.2	0.03
Slovakia	m	48 845	5.4
Ukraine	o	603 700	46
Vatican City State	o	0.4	0.0008

<sup>1</sup> M=member; c=candidate; o=other

Table 2. Countries that participated to the questionnaire survey (N=25).

Country	EU status <sup>1</sup>	Area (km <sup>2</sup> )	Inhabitants (millions)	Surveillance system <sup>2</sup>	Funding sources <sup>3</sup>	Number of programmes	Number of people <sup>4</sup>	Records since...
Albania	o	28 748	3.6	None	None	0	1F, 2P	2004
Andorra	o	468	0.07	General	Gov	1	1F, 2P	2000
Austria	m	83 870	8.3	None	Gov+Proj	2	5F, <5P	Approx. 1970 (rabies older)
Belgium	m	30 528	10.7	Partial	Gov+Hunt	≥10	5F, 20P?	Not known
Bosnia and Herzegovina	o	51 209	4.6	None	Gov	1	2F, 5-7P	1962 (roe deer parasites)
Denmark	m	43 094	5.4	Partial	Gov	1	10P	Approx. 1935-40
Finland	m	338 000	5.3	None	Gov	4	2F, 5-10P	1960's
France	m	550 000	63.7	General	Gov + Hunt	8	3F, many P	1968
Germany	m	356 854	82.5	None	Gov + NGOs	2	?P	At least 1990
Greece	m	131 957	11.2	None	Gov	6	10P	1994
Hungary	m	93 000	10.1	Partial	Gov	2	1F?, 15P?	1978
Italy	m	301 263	57.3	Partial	Gov	1	10F, 10-20P	1999
Luxembourg	m	2 586	0.5	None	Gov	1	Approx. 4P	1990
Netherlands	m	41 526	16.4	Partial	Gov+Farm	5	10-20?	2008
Norway	o	323 802	4.7	General	Gov+Hunt	2 (+4)	4F, 7P	1960
Portugal	m	92 079	10.4	Partial	Gov+Hunt+EO	13	Vets: 20F, 100P	Not known
Romania	m	237 500	21.5	None	Gov +Univ	13	30P	2000
Russia	o	17 075 200	141	Partial	Gov	3	>100F? >1000P?	Not known
Serbia	o	77 474	8	None	None (Hunt)	2	3-4P?	2006
Slovenia	m	20 273	2.0	None	Gov +Hunt	1	1F, 5P	1957
Spain	m	504 782	45.3	Partial	Gov +Univ	>5	10F, 50P	2005
Sweden	m	449 964	9.2	General	Gov	2	8F, 5P	Approx. 1945
Switzerland	o	41 290	7.6	General	Gov+Univ+Proj	2 (+4)	4-5F, >7P	1950
Turkey	c	780 580	70.5	None	Gov + Proj	? many projects	100P?	1990
United Kingdom	m	244 820	60.4	General	Gov	>10	3F, 30-40P	Not known

<sup>1</sup> M=member; c=candidate; o=other

<sup>2</sup> None=No general surveillance, but some degree of surveillance for a few specified diseases; Partial=Partial general surveillance, i.e. wide range of programmes but restriction in various ways (e.g. geographical regions or covered species); General=comprehensive general surveillance (entire country, covered species, investigated diseases)

<sup>3</sup> Gov=governmental; Proj= research projects; Hunt=hunters; Farm=farm industry; EO=environmental organizations; Univ=University

<sup>4</sup> F=full time; P=part time

Table 3. Estimated numbers of investigated cases per year per country. Numbers were unknown for six countries that participated to the survey (Belgium, Germany, Hungary, Luxembourg, Serbia, Turkey).

Country	Healthy cases/year	Pathological cases/year	Pathological cases/km <sup>2</sup> x10 <sup>-4</sup>
Andorra	110	80	1709
Slovenia	2'000	1'000	493
Portugal	6'600	2'000	217
Denmark	300-1000	800-1000	209
Austria	9000	1000+	119
Switzerland	Up to >1'000	400	97
France	>10'000	5'000	91
Italy	Not known	1700	56
Romania	2'200-2'800	1'100-1'400	53
Norway	1000-2000	1000-1500	37
Netherlands	15	150	36
Sweden	3'000-4'000	1'500	33
United Kingdom	70	650-750	29
Spain	5'000	1'000	20
Albania	100	50-60	19
Finland	500	500	15
Greece	30	70-150	8
Bosnia and Herzegovina	100-150	30-50	1
Russia	100'000?	1'000?	<1

## Discussion

Participation to the survey was high (50% of European countries). Efforts were made to contact representatives of as many European countries as possible, and to encourage them to participate to the survey. The fact that so many people completed the questionnaire and attended the meeting indicates a large interest in the topic.

Only few countries carry out comprehensive general wildlife health surveillance, but a certain level of disease surveillance in wildlife is present in all participating countries. Distinction between partial general wildlife health surveillance and no general wildlife health surveillance at all is made difficult by the fact that restrictions characterizing partial surveillance sometimes concerned disease selection. However, surveillance programmes restricted to selected diseases were basically defined as too restrictive to be called "general wildlife health surveillance programme" as defined for this survey. To allow a better understanding of the status of wildlife health surveillance activities in Europe, it would be useful to categorize these activities, both active and passive, in more detail.

In countries without a general wildlife health surveillance programmes, the five diseases most often considered for specific surveillance programmes were rabies, avian influenza, tuberculosis, classical swine fever, and trichinellosis. Overall, participating countries seemed to be in agreement about the selection of diseases considered as important.

The number of diseased and healthy cases examined per country is very variable. Regarding the examination of carcasses, numbers are generally low. However, overall, nearly 20 000 carcasses are examined each year, which is considerable high number. Also, not all countries have participated in the survey, which means that this number is most probably an underestimate. In addition, around 50 000 animals are examined in the frame of specific programmes concerning selected diseases. Taken together, these numbers illustrate the importance given to surveillance of wildlife diseases throughout Europe.

Seventeen countries reported to often or always perform a gross pathological examination of carcasses. Histological examination is much less common, although this technique is often essential for disease diagnosis. Regarding additional laboratory investigations, parasitology and bacteriology are the most commonly performed analysis. Virology, toxicology and

serology are usually not used on a routine base. Parasite infestation and bacterial infections are common causes of health problems in wildlife. Other factors, particularly financial aspects, play an important role in the restricted use of certain investigation techniques. The number of surveillance programmes per country is variable and seems independent of the country size. The existence of many programmes would require a centralization of information in order to provide a country-wide overview about the wildlife health situation in these countries. Fourteen countries possess records on wildlife health investigations for more than 10 years, but a number of countries have more recently implemented a health surveillance programme and/or a data archive. This shows an increasing interest in wildlife health surveillance in Europe.

In all countries, governmental support is a key factor in the existence of a certain degree of wildlife health surveillance. Estimation of the number of people involved in wildlife health surveillance is made difficult by the possible different interpretation of “people involved in surveillance”. This can indeed include only wildlife health experts directly involved in examination of carcasses or leading specific surveillance programmes. However, it can also include field people such as game-wardens, hunters and biologists retrieving carcasses, and numerous laboratory personnel performing additional investigations on samples collected at necropsy. While the classification of full-time personnel should not pose any problem, part-time personnel can reach very high numbers depending on how it is defined. In this regard, part-time personnel have possibly been underestimated in all countries.

The absence of a general wildlife health surveillance programme in many countries can have several reasons. A lack of resources (funding, qualified personnel), lack of interest or awareness of the local governments, scientists and/or hunters (apparent absence of wildlife-related health concerns, absence of existing traditions regarding wildlife investigations, and/or absence of initiative of any interest group), and lack of coordination of existing programmes (many people/institutions partially involved) are all factors that can explain the difficulty of implementing or carrying out general wildlife health surveillance programmes.

In conclusion, the results of the survey indicate a clear interest for wildlife health surveillance in European countries. Recent implementation of surveillance programmes and archives indicate the growing importance of considering wildlife in health surveillance programmes. There is a lack of general surveillance in most countries and restrictions exist regarding the techniques used for disease diagnosis. As passive general surveillance appears to be uncommon, general knowledge about wildlife health (rather than prevalence of infectious agents possibly harmless to wildlife species) is scarce and early detection of unexpected emerging diseases might not be possible. However, even if the situation can be improved, examinations related to animal or human health are performed on an impressive number of wild animals each year in Europe.

### **Acknowledgements**

Many thanks go to Paul Heyman (Ministry of Defence, Belgium), Paul Tavernier (Belgian Wildlife Disease Society), and their colleagues for providing the venue for this meeting. Summaries of the status of wildlife health surveillance per country were provided by Kastriot Korro (Albania), Landry Riba (Andorra), Gabrielle Stalder (Austria), Paul Tavernier and Annick Linden (Belgium), Mirsada Hukic (Bosnia and Herzegovina), Anne Sofie Hammer (Denmark), Marja Isomursu (Finland), Olivier Mastain (France), Gudrun Wibbelt (Germany), Billinis Charalambos (Greece), Karoly Erdelyi (Hungary), Riccardo Orusa (Italy), Joseph Schon (Luxembourg), Andrea Groene (The Netherlands), Kjell Handeland (Norway), Patricia Santos (Portugal), Gabor Czirjak (Romania), Alexander Platonov (Russia), Sara Savic (Serbia), Gorazd Vengust (Slovenia), Christian Gortazar (Spain), Carl Hård (Sweden), Marie-Pierre Ryser (Switzerland), Ezgi Akdesir (Turkey), and Paul Duff (U.K.). The map was drawn by Julien Fattebert (Switzerland).